

The great bulk of the evidence, in fact, on this part of the question is to the same effect; and it has not been neutralised, in the judgment of the Commissioners, by other views expressed by a small number of distinguished witnesses.

Amongst the latter Dr. A. W. Williamson thinks that the development of schools would be preferable to the establishment of laboratories. His views however do not seem to be fully matured; the following extract from his evidence showing that though more in favour than perhaps anyone else of equal authority, of combining school instruction with original research, he still perceives that some independent provision for the latter might be desirable. He says:—

"At the same time it is quite possible that, in exceptional cases, research might with advantage be carried on in separate places; but I should always view with regret, as a waste of resources, the separation of that higher work of research from the more humble work of teaching, which naturally belongs to it. They help one another, and I think that each would lose from being separated from the other; still, in some cases, it might possibly be advisable."

Dr. Siemens, on the other hand, apprehends that the establishment of Government laboratories, which, amongst other functions, should be accessible to private workers, might cause disappointment to some who might not be able to gain access to them, and that there might be favouritism and want of discrimination in the dispensing of the privileges in question.

Dr. Burdon Sanderson would rather see increased facilities given to the great schools of medicine for the prosecution of physiological research, than laboratories of an independent character established. He questions whether we have at present a sufficient number of trained workers to use establishments of the latter kind; whilst Lord Salisbury is doubtful whether by any moderate expenditure of funds we could provide an expensive class of scientific instruments of all kinds for all the persons who might be inclined to use them.

The Commissioners, after fairly balancing the views laid before them, sum up this question in their final conclusions, as follows:—

"More complete means are urgently required for scientific investigations in connection with certain Government departments; and physical as well as other laboratories and apparatus for such investigations ought to be provided."

(To be continued.)

IRBY'S BIRDS OF GIBRALTAR

The Ornithology of the Straits of Gibraltar. By Lieut.-Col. L. Howard L. Irby, F.Z.S., &c. (London: R. H. Porter, 6, Tenterden Street; Dulau and Co., Soho Square, 1875.)

HERCULES, as in our schooldays we used to be told, once took the trouble of cleaving asunder the isthmus which in his time, whenever that was, joined Europe and Africa. Colonel Irby has been at the pains of reuniting the two continents, not indeed actually, but for the purposes of his work; and has thus undone, so far as ornithology is concerned, the labour of the demigod. Though we certainly have no fault to find with the exploit which gave the waters of the Atlantic access to

the Mediterranean basin, and fully admit the advantage which has thereby accrued to most European nations, and to our own in particular, it must be confessed that we deem more highly the feat of our modern hero than the prowess of him of antiquity.

It is now some years since all authorities have recognised the fact that, if socially Africa begins, as the satirical statesman said, at the Pyrenees, Europe does not biologically end at the Strait of Gibraltar; and the readers of NATURE do not need reminding that between the animal and vegetable products of either side of that narrow channel there is little essential difference. Thus the southern part of Andalusia and the northern part of Morocco form a very homogeneous district to come under the survey of an observant ornithologist perched upon the rocky heights of "Old Gib." Such an observant ornithologist Col. Irby has proved himself to be, as might indeed have been expected of him, when we remember that he was one of the few officers of the now ancient Crimean time who was sufficiently undisturbed by war's alarms to follow his pursuits over the steppes of the Tauric Chersonese, and again, when called not long after to India, in days yet pre-Jerdonian, did not intermit his occupations in Oudh and Kumaon for all that rebellion, if not something more, was still rife in those districts.

We have seldom had the pleasure of reviewing a more engaging and more unpretending book than that which is now before us. It is by one who shows himself in almost every page to be a thorough field-naturalist, and a field-naturalist of the best kind. Cherishing with pardonable pride, as a man should do, his own observations, he can yet believe that those of others may likewise have some merit, and thus he gives us an admirable account of the place of his choice, though, as he modestly remarks, "there is ample room for anyone with energy to work out a great deal more information on the birds of the Straits." Nearly all that he has to say about those of the Spanish side is from his own personal knowledge, acquired during a more or less prolonged stay at "the Rock," between February 1868 and May 1872, and again from February to May 1874, but including in this time only one summer. "For the first three years of my residence at Gibraltar," he says, "I was quartered with my regiment, the remaining time being passed there chiefly with a view to ornithological pursuits, from time to time making excursions, generally of about a fortnight's duration, to some part or other within the districts above mentioned, but chiefly confining my attentions to the country within a day's journey of Gibraltar." The observations on the Moorish birds are in great measure culled from the manuscript of the late François Favier, a French collector well-known to many ornithologists in England, who died in 1867 after a residence of more than thirty years at Tangier. This manuscript our author secured at a high price,* to find indeed, "amidst a mass of bad grammar, bad spelling, and worse writing, which cost many hours to decipher, that it did not contain so much information as I had reason to anticipate, a good deal of the matter having been copied from other authors;" and, we may add, not copied with much discrimination.

The remaining materials of which the Colonel has

* This manuscript, or possibly an older one of which it is a corrected copy, was seen at Tangier in 1844 by Wolley. Colonel Irby has lately presented it to the Zoological Museum of the University of Cambridge.

availed himself (would that he had discovered the lost *Fauna Calpensis* of John White !) are the various papers on Spanish Ornithology, by Lord Lilford and Mr. Howard Saunders, published in the *Ibis*, and the late Mr. C. F. Tyrwhitt Drake's notes on the birds of Tangier and Eastern Morocco, which appeared in the same journal. The list of Tangerine birds by Herr Carstensen (*Naumannia*, 1852, i. pp. 76-79) gave but little help ; but our author does not seem to have been aware of the late Mr. G. W. H. Drummond Hay's observations (*Proc. Zool. Soc.* 1840, pp. 133-135), which, though brief, appear to be at least trustworthy.

Colonel Irby catalogues 335 species as unquestionably occurring within his limits, besides some twenty-five more which may be reasonably looked for, though he himself has not fallen in with them ; while many others are doubtless to be found as stragglers, for "so local are birds in Southern Spain, that perhaps some may be resident and overlooked in consequence of the exact locality they frequent having been unvisited." His remarks on all these are exceedingly discriminative and to the point, furnishing a supply of information for which ornithologists will be duly grateful, but they are mostly of too special a kind to give extracts from them here. We prefer quoting what he has to say on Migration, as being a subject in which more of our readers will take interest :—

"Without doubt caused by the absence or abundance of food, which in turn is caused by difference of temperature, the passage of birds in these parts begins with most species almost to a day in spring, usually lasting for about three weeks, though some, as the Hoopoe and the Swallows, are more irregular in their first appearance ; and with these the migration lasts throughout a longer period.

"Few (indeed hardly any birds) do not migrate or shift their ground to some extent. I can name very few which do not appear to move, viz., Griffon-Vulture, Imperial Eagle, Eagle-Owl, Blue Thrush, all the Woodpeckers, Treecreeper, Black-headed Warbler, Dartford Warbler, Crested Lark, Chough, Raven, Magpie, Red-legged and Barbary Partridges, and the Andalucian Quail. Generally speaking, it seems to me that in the vernal migration the males are the first to arrive, as with the Wheatears, Nightingales, Night-herons, Bee-eaters ; but this is a theory which requires more confirmation. Some species, as the *Neophron* and most of the *Raptores*, pass in pairs.

"Most of the land-birds pass by day, usually crossing the Straits in the morning. The waders are, as a rule, not seen on passage ; so it may be concluded they pass by night, although I have occasionally observed Peewits, Golden Plover, Terns, and Gulls passing by day.

"The autumnal or return migration is less conspicuous than the vernal : and whether the passage is performed by night, or whether the birds return by some other route, or whether they pass straight on, not lingering by the way as in spring, is an open question ; but during the autumn months passed by me at Gibraltar, I failed to notice the passage as in spring, though more than once during the month of August, which I spent at Gibraltar, myself and others distinctly heard Bee-eaters passing south at night, and so conclude other birds may do the same.

"... Both the vernal and autumnal migrations are generally executed during an easterly wind, or Levanter ; at one time I thought that this was essential to the passage, but it appears not to be the case, as, whether it be an east or west wind, if it be the time for migration, birds will pass, though they linger longer on the African coast before starting if the wind be westerly ; and all the very large flights of *Raptores* (Kites, Neophrons, Honey-

Buzzards, &c.) which I have seen passed with a Levanter. After observing the passage for five springs, I am unable to come to any decided opinion, the truth being that, as an east wind is the prevalent one, the idea has been started that migration always takes place during that wind. Nevertheless, it is an undoubted fact that during the autumnal or southern migration of the Quail in September they collect in vast numbers on the European side if there be a west wind, and seem not to be able to pass until it changes to the east ; this is so much the case that, if the wind keeps in that quarter during the migration, none are hardly to be seen.

"On some occasions the passage of the larger birds of prey is a most wonderful sight ; but of all the remarkable flights of any single species, that of the Common Crane has been the most noteworthy that has come under my own observation.

"On the Andalucian side, the number of birds seen even by the ordinary traveller appears strikingly large, this being, no doubt, in a great measure caused by the quantity which are, for ten months at least out of the year, more or less on migration ; that is to say, with the exception of June and July, there is no month in which the passage of birds is not noticeable, June being the only one in which there may be said to be absolutely no migration, as, during the month of July, Cuckoos and some Bee-eaters return to the south" (pp. 13-15).

For want of space we must pass over the spirited descriptions which the Colonel gives of the various localities within his limits, and his experience of several shooting excursions, the relation of which is wisely subordinated to the main object of the book. We can fully enter into his feelings when he was for two hours the unobserved observer of a vast assemblage (at the lowest computation, he says, between three and four thousand) of wild geese, for we ourselves remember watching just such a host, and under much the same circumstances, years ago on the banks of a Lapland river ; but we cannot here introduce his account. Our author has added to the value of his book by giving a list of the Mammals of Southern Spain, forty in number without counting the Barbary Ape, whose presence on "the Rock" is the origin of so many theories facetious as well as scientific ; and the volume concludes with a convenient summary of the Birds, besides a very good index. As reviewers we are of course entitled to our "growl," and this shall be that the two neat maps which illustrate the book are not drawn to the same scale, and while that of Northern Morocco, for which we are especially thankful, takes in a great deal more than Colonel Irby's district, that of Southern Spain leaves out at least as much. With this we bid him farewell.

HOFMANN'S REPORT ON THE PROGRESS OF CHEMICAL INDUSTRY

Bericht über die Entwicklung der Chemischen Industrie während des letzten Jahrzehends ; im Verein mit Freunden und Fachgenossen erstattet von Dr. A. W. Hofmann. Autorisierter Abdruck aus dem Amtlichen Bericht über die Wiener Weltausstellung im Jahre 1873. (Report on the Development of Chemical Industry during the last Ten Years ; in conjunction with friends and fellow-workers. Composed by A. W. Hofmann. Authorised reprint of the official report on the Vienna Exhibition of 1873. Vol. iii. Part I.) (Braunschweig : Fr. Vieweg und Sohn, 1875.)

THE Imperial Commission of Germany for the Vienna Exhibition of 1873 have put the report on the third group, "Chemical Industry," into the hands of Dr.